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Dkt. 01184

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application:

Group Art Unit: 1742

PIERRE LE BRUN et al

Examiner: S. Kastler

Serial No.: 09/926.289

Filed: December 7, 2001

Title: IMPROVED METHOD AND DEVICE FOR DEGASSING  
AND SEPARATION OF INCLUSIONS IN A LIQUID  
METAL BATH BY INJECTION OF GAS BUBBLES

**RESPONSE**

Honorable Commissioner for Patents  
P. O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The following remarks are submitted in response to  
the Office action mailed December 8, 2003.

Claims 17 through 35 and 37 through 39 have been  
rejected under 35 USC 102(b) as anticipated by Montgrain and  
have also been rejected under 35 USC 103 as obvious over  
Montgrain. In addition, Claims 36 and 40 have been rejected  
under 35 USC 103 over Montgrain in view of Manabu et al.

It is noted that Claim 17 is directed to a device  
for the injection of gas bubbles into a liquid metal contained  
in a treatment volume, comprising at least one static  
injection part made of a material inert to the liquid metal  
and wettable by the liquid metal, the static part comprising a

plurality of orifices disposed on a substantially planar surface.

The invention as claimed is clearly distinguished from the teaching of Montgrain.

Figure 1 of Montgrain shows a plurality of protuberances, a single orifice being located at the top of each protuberance. Figure 1 clearly does not show any embodiment in which a plurality of orifices are disposed in a substantially planar surface. The Office action appears to allege that the protuberances of Montgrain are "removable (by cutting for example)" but in fact, it is the planar surface which is cut to obtain a plurality of protrusions (col. 5, lines 26-29). There is no disclosure or suggestion of cutting protrusions to form a planar surface.

It is further noted that Figure 10 discloses a series of "narrow continuous ribs 24 in which a row of gas orifices 25 are provided." Figure 10 thus does show a plurality of orifices in a surface, but the invention as claimed is not disclosed by this figure, based upon the teaching of Montgrain at column 5, lines 18 through 22, in which it is stated that "[t]he periphery of the top surface of each protrusion or edges of each rib constitute an abrupt discontinuity to check or hinder further lateral movement of the metal/gas interface across the surface of a diffuser plate or other structure." Thus, the edges of each protrusion 3 or

ridge 24 is not planar, but rather contains "an abrupt discontinuity" to hinder lateral movement of the bubbles. Accordingly, in no embodiment disclosed by Montgrain is there shown a substantially planar surface containing a plurality of orifices.

As regards the obviousness rejection, the Office action states that Montgrain at column 5, lines 20 to 30, discloses that rather than using protuberances to contain the orifices, the orifices can be formed in a continuous surface of the diffuser plate. While this is correct, it is noted that Montgrain also states that "bubble growth-hindering discontinuities may be formed by the peripheries of discreet recesses arranged between gas orifices in an otherwise continuous surface" (Column 5, lines 23-26).

Thus, Montgrain specifically discloses that in the embodiment where the orifices are formed in a planar surface, recesses must be formed between the orifices to hinder the growth of the bubbles. Once again, Montgrain does not disclose or suggest a plurality of orifices in a substantially planar surface.

The Office action further argues that the claimed configuration does not materially alter the operation of the orifices. However, the claimed configuration is specifically contrary to the configuration of Montgrain, and in fact, the bubble growth limiting mechanism according to the invention is

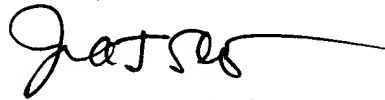
materially different, based on the physical properties of the surface surrounding the orifices, rather than the physical shape of the surface.

Accordingly, the claimed invention cannot be anticipated by Montgrain, which does not disclose a plurality of orifices in a substantially planar surface, and is not rendered obvious by Montgrain which does not even suggest a plurality of orifices in a substantially planar surface, Montgrain specifically teaching against the claimed configuration.

Withdrawal of these rejections is accordingly requested.

In view of the foregoing remarks, Applicants submit that the present application is now in condition for allowance and an early allowance of the application is earnestly solicited.

Respectfully submitted,



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